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21 April 1965

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Projects 552 and 552A
Progress Report - March 1965

Gentlemen,

Enclosed is a copy of  Progress Reports on
Projects 552 and 552A for the period March 1965. Also included is
our Finance Report for the month of March.

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Very truly yours,



Vice President - Marketing

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RJL/de

Enc: (1) P.R. - 4 pp
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PROGRESS REPORT
For
VERSATILE, HIGH PRECISION STEREO
POINT TRANSFER DEVICE

Period Covered: March 1965
Dated: 20 April 1965
Job No.: #552 and #552A
Document No.: OD-244

#552 - OD-244

PROGRESS REPORT
For
VERSATILE, HIGH PRECISION STEREO
POINT TRANSFER DEVICE

OBJECTIVE ASSEMBLY

Improvement in appearance and centering of dot reticle and zoom magnifier scanning drive feedback potentiometer with principal work in this area in a companion viewer now under test.

The optics for the dot reticle required a change in the mounting of mirrors to eliminate their distortion and resulting degradation of the dot image. This defect was noticeable when minimum dot was observed with highest zoom magnification. To center dot with much greater precision than before, an adjusting fixture has been made to help locate the fiber cable with respect to zoom magnifier image.

To achieve a more precise relationship between scanning velocity and image magnification, much work has been done in study and adjustment of scanning drive electronics. Correction of a significant error is being made in the zoom magnifier feedback potentiometers resistance function, and are now being rebuilt by the manufacturer. Return of potentiometers, their reassembly into system, and final fine tuning of this system should be completed by end of April.

The modification of the high intensity light source appears to provide adequate illumination for the 30x to 128x magnification range. Since this device is solenoid operated, and mounted near the 250 watt DKM lamp, thin flat springs provide shock control to minimize effect on lamp life. Film temperature is below 125 degrees F in this high brightness spot.

#552 - OD-244VACUUM FILM HOLDDOWN

Manufacture of platens with three (3) highly polished macrogrooves is nearing completion, and will be received late in April. The following are comments on development work on a companion viewer using platens with similar but more visible macrogrooves.

The pneumatic clamp developed to reduce the leakage at the loop forming slot appears quite useful and necessary to keep pulldown time near 10 seconds with all films used in system. In addition, an interception in air exhaust has also shown success. About 3 seconds after initiation of holddown operation, a 3 second period for relaxation of film is introduced, permitting film to straighten and rid itself of air pockets. At the same time, the vacuum reservoir is evacuated, ready to complete holddown motion.

The manifolds currently used are made of transparent plastics allowing complete visibility of both films' margins. However, the current design is a bit delicate and also occasionally develops significant leaks at manifold ends where film has to make the transition from plane to ramp shape of manifold. The reduction of pressure difference between upper and lower film surfaces through leakage has an adverse effect on pulldown time, especially in the final moments where the air pockets are being pressed out. Further work is being done to ruggedize and seal manifolds.

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Improvements have been made to reduce noise and long term operating temperature of vacuum pump. Vibration isolators have been adjusted for more freedom, and more flexible vacuum hoses have been installed to allow less restraint of pump, therefore, better isolation from cabinet. Ventilation of pump enclosure has been greatly increased by providing more inlets for cooling air and addition of a fan to exhaust heated air.

SCANNING DRIVE

A system with the three speed gear boxes has been in use during this reporting period. The principle problems with them have been to repair some assembly oversights in making them more vibration resistant by their manufacturer after excessive backlash developed in two axes. In addition, we have taken further measures to reduce loosening under vibration of other drive members.

The zoom magnifier potentiometers appears to be one reason for the poor correspondence between magnification and scanning velocity at channel magnifications other than 1:1. Re-examination of error contributions in electrical and optical areas is now in progress to hold correspondence to near 5% error.

The switch added to synchronize motion of all axes has been quite useful, but requires a switch having a much lower operating force and less differential than one being used. The same switch type may also replace the direction sensing units now in use. The reasons for change are less restraint for joystick to null, greater possible latitude for switch operation and greater separation of direction sensing and synchronizing switching actions. Although a suitable switch has not been found, we expect conclusion here during next reporting period.

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As a part of the final motions in the improvement of the scanning drive debugging, we are making every effort to increase system reliability. For example, forced cooling has been added to control and auxiliary cabinets so that circuits may run continuously with less than 20 degrees F rise above room temperature.

Work for the Next Reporting Period

1. Complete scanning drive, mechanical and electric modifications.
2. Obtain experimental glass platens for vacuum holddown installed and evaluated.
3. Design, fabricate and install ruggedized vacuum manifold and plumbing changes.
4. Complete optical debugging.
5. Complete system debugging.

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